

# HW46

5. base is  $\frac{1}{4}$   
 $y = \frac{1}{4}^x$  ✗  
 up 5  
 over x

$$y = -\left(\frac{1}{4}\right)^x + 5$$

6.  $y = 2^x$  ✗  
 right 1  
 VD by 3

$$y = 3(2)^{x-1}$$

7.  $y = \frac{1}{5}^x$  ✗  
 down 1  
 over x  
 HD by 3

$$y = -\left(\frac{1}{5}\right)^{x/3} - 1$$

14.  $(-5)^{-3} = \frac{1}{(-5)^3} = \frac{1}{-125}$

15.  $-5^2 = -25$

16.  $\left(\frac{5}{6}\right)^{-2} = -\frac{5^{-2}}{6^{-2}} = -\frac{6^2}{5^2} = \frac{-36}{25}$

17.  $\left(\frac{2}{3}\right)^{-5} = \left(\frac{3}{2}\right)^5 = \frac{3^5}{2^5} = \frac{243}{32}$

18.  $(8b^{-4})(-15b^{-14}e^{\pi})$   
 $-120b^{-20}$   
 $\frac{-120}{b^{20}}$

19.  $\frac{-88a^{10}b^{-4}}{-8a^3b^5}$   
 $\frac{11a^7}{b^9}$

20.  $\left(\frac{40a^{-2}}{-12a^6}\right)^{-3}$

$$\left(-\frac{10}{3a^8}\right)^{-3}$$

$$\left(\frac{-3a^8}{10}\right)^3$$

$$\frac{-27a^{24}}{1000}$$

21.  $\sqrt{512x^7y^{20}z}$

$$512 \sqrt{2^9x^7y^{20}z}$$

$$2^{256} 2^{9/2}x^{7/2}y^{20/2}z^{1/2}$$

$$2^{128} 2^4 \cdot x^3 \cdot y^{10} (\sqrt{2xz})$$

$$2^{64} = 2^{60}$$

$$16x^3y^{10}(\sqrt{2xz})$$

22.  $\sqrt[4]{96a^5b^{22}c^{15}}$

$$96 \sqrt[4]{2^5 \cdot 3a^5b^{22}c^{15}}$$

$$3 \sqrt[32]{2ab^5c^3} \left( \sqrt[4]{6ab^2c^3} \right)$$

$$8 \sqrt[4]{2^2}$$

$$4 \sqrt[2]{2}$$

23.  $\sqrt[3]{108m^{10}n^{50}p^{100}}$

$$108 \sqrt[3]{2^3 \cdot 3m^{10}n^{50}p^{100}}$$

$$2 \sqrt[54]{2m^3n^{16}p^{33}} \left( \sqrt[3]{13mn^2p} \right)$$

$$2 \sqrt[26]{2}$$

$$2 \sqrt[13]{2}$$

24.  $n^{1/7}$  25.  $x^{6/5}$  26.  $x^{3/7}$

27.  $\sqrt[5]{x^4}$  28.  $\sqrt[9]{y}$

29.  $2^{2x} = 2^{3/3}$

$$2x = 9$$

$$x = 9/5$$

$$30. 3^{3(2x+1)} = 3^{4x}$$

$$3(2x+1) = 4x$$

$$6x+3 = 4x$$

$$2x = -3$$

$$\boxed{x = -3/2}$$

$$31. 2^x = 2^{-6}$$

$$\boxed{x = -6}$$

$$32. (x^{3/5})^{5/3} = (27)^{5/3}$$

$$x = 27^{5/3}$$

$$x = (3\sqrt{27})^5$$

$$x = 3^5$$

$$\boxed{x = 243}$$

$$33. (x^{5/4})^{4/5} = (7)^{4/5}$$

$$x = 7^{4/5}$$

$$\boxed{x = 10.33}$$

$$34. (x^{5/8})^{8/5} = (12.75)^{8/5}$$

$$\boxed{x = 58.724}$$

$$35. a = 25,000$$

$$b = 1 - .08 = .916$$

$$y = 25,000(0.916)^3$$

$$\boxed{y = 19,214.38}$$

$$36. \frac{153.6}{9.6} = \frac{a(b)^9}{a(b)^5}$$

$$(16)^{1/4} = (b^4)^{1/4} \quad \boxed{y = 0.3(2)^x}$$

$$\boxed{2 = b}$$

$$y = a(2)^x$$

$$9.6 = a(2)^5 \rightarrow a = 0.3$$

$$37. 3000 = 1000(b)^{12}$$

$$(3)^{1/12} = (b^{12})^{1/12}$$

$$1.096 = b$$

$$\boxed{9.6\% \text{ growth}}$$

$$38. 25 = 50(b)^8$$

$$25 = 50(b)^8$$

$$\left(\frac{1}{2}\right)^{1/2} = (b^8)^{1/8}$$

$$0.917 = b$$

$$100 - 91.7 = \boxed{8.3\%}$$

$$39. (1, 7680)$$

$$(3, 7077.89)$$

$$\frac{7077.89}{7680} = \frac{a(b)^3}{a(b)^1}$$

$$(0.922)^{1/2} = (b^2)^{1/2}$$

$$0.96 = b$$

$$\frac{7680}{.96} = \frac{a(.96)^1}{.96}$$

$$a = 8000$$

$$\boxed{\text{He paid } \$800}$$

$$\boxed{4\% \text{ decay}}$$